

Web Tools for Semantic Publishing

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Don't develop Wikis but

- strong interest in semantization
 - common goals
 - similar challenges
- develop reusable semantic (web) tools
- integration into Web frameworks
 - Drupal (<http://beta.planetmath.org/>),
 - MediaWiki (<http://formulasearchengine.com/>)
 - Vanilla 2 (<http://arxivdemo.mathweb.org/>)

Three main topics

- Active semantic documents (JOBAD)
- Authoring semantic documents (RedSyS)
- Semantic mathematics (LaTeXML & MathWebSearch)

Jobad in Action

nucl-th.0011027 by cdavid - arXiv Demo - Minefield

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Plugins - P... semnet-se... Software ... File/...html Guest Room File/...html Plugins - a... nucl-th.00... http...xhtml nucl-th... Go

http://arxivdemo.mathweb.org/article/998/nucl-th.0011027

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Found in: Articles
nucl-th.0011027 2011-01-11 16:18:17

Edit Details>Delete Article

Author cdavid
Released January 11

Low energy scattering and photoproduction of η -mesons on deuterons.

Authors

§ 1. Introduction

§ 2. AGS formalism

In terms of the AGS transition operator U_{11} the ηd elastic scattering amplitude is represented as

$$f(\mathbf{p}_1, \mathbf{p}_1; z) = -(2m)^{-1} M_1 < \mathbf{p}_1; \mathbf{p}_1 | U_{11} | \mathbf{p}_1; \mathbf{p}_1 >$$

with the on-energy-shell conditions $|\mathbf{p}_1| = |\mathbf{p}_1|$ and $z = p_1^2 / 2M_1 + E_d$

the subscript 1 labels the $\eta(NN)$ partition and the η -deuteron channel. The equations

$$U_{\beta\alpha}(z) = (1 - \delta_{\beta\alpha}) G_0^{-1}(z) + \sum_{\gamma=1}^3 (1 - \delta_{\beta\gamma}) \gamma_{\beta\gamma} G_{\gamma\gamma}(z) U_{\gamma\alpha}(z)$$

with $G_0(z)$ (Green's operator) of the three particles involved. This set of equations couples all 3×3 matrices $U_{\alpha\beta}$ and $U_{\gamma\delta}$. Here each of the subscripts runs through the values 1, 2 and 3.

Context Menu (3 Icons)

Discussion Thread

InfoMarkers

FoldingBar

InfoBar

Definition Lookup

$f \subseteq X \times X$ is called a **partial function**, iff for all $x \in X$ there is at

Definition Lookup Results

DEFINITION:

Cartesian product :
 $A \times B := \{ \langle a, b \rangle \mid a \in A \wedge b \in B \}$, call
 $\langle a, b \rangle$ pair .

Semantic Folding

$$s = s_i + v_i \Delta t + \frac{1}{2} a_i (\Delta t)^2$$

Fold
Semantic Fold

$$s = s_i + s_v + s_a$$

contribution from acceleration

Unit Conversion

City A is 9144ft from city B and 5164ft from city C .

Look-up Definition
 convert to miles
 convert to meters
 convert to feet
 convert to inches
 convert to yards

City A is 3048m from city B and 5164ft from city C .

Prerequisites Navigation

Prerequisites Graph for ./slides/dmath/en/sets-operations.tex – Planetary SandBox

http://planetbox.kwarc.info/art... phase 6 date

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Prerequisites Graph for ./slides/dmath/en/sets-operations.tex

Go

Who's Online (1)
 kohbase 11:49AM

```

graph TD
    THIS --> sets-relations
    sets-relations --> sets-introduction
    sets-relations --> math-talk-definitions
    sets-introduction --> dates
    math-talk-definitions --> math-talk
    math-talk-definitions --> highschool
    math-talk-definitions --> sequences
    math-talk --> relation1
    highschool --> relation1
    sequences --> relation1
    relation1 --> setname2
    setname2 --> set1
    setname2 --> setname1
  
```

math-talk, highschool, sequences

Mathematics uses a very effective technique for dealing with conceptual complexity. It usually starts out with discussing simple, basic objects and their properties. These simple objects can be combined to more complex, compound ones. Then it uses a definition to give a compound object a new name, so that it can be used like a basic one. In particular, the newly defined object can be used to form compound objects, leading to more and more complex objects that can be described succinctly. In this way mathematics incrementally extends its vocabulary by add layers and layers of definitions onto very simple and basic beginnings. We will now discuss four definition schemata that will occur over and over in this course.

edhribe

Find: la Next Previous Highlight all Match case

JavaScript framework

- embed semantic services locally into documents
- new interactions based on semantic data (RDFa)
- lightweight
- modularity & dynamic loading

Next stop: Authoring Semantic Documents

- Authors – the main asset of wikis
- Textboxes - the technology of 2012?

Next stop: Authoring Semantic Documents

- Authors – the main asset of wikis
- Textboxes - the technology of 2012?
 - plain text is awesome
 - WYSIWYG is nice but too heavy & buggy
 - and yet, <textarea> - not cool (Codemirror, Ace?)
- What should semantic editing be like?
 - suggests annotations
 - reduces repetitive tasks
 - folds annotations

Editing Semantics is harder

```
1The gravitational potential energy of a system of masses  $m_1$  and  $M_2$ 
  at a distance  $r$  using gravitational constant  $G$  is
3\begin{equation}
  U = -G\frac{m_1M_2}{r}+K
5\end{equation}
  where  $K$  is the constant of integration. Choosing the convention that  $K=0$ 
7makes calculations simpler, albeit at the cost of making  $U$  negative.
```

Editing Semantics is harder

```
1The \termref{cd=physics-energy, name=grav-potential}{gravitational potential energy}
  of a system of masses \STRlabel[m1]{m_1$} \STRcopy{m1} and \STRlabel[m2]{M_2$} \STRcopy{m2}
3at a distance \STRlabel[r]{r$} \STRcopy{r} using
  \termref{cd=physics-constants, name=grav-constant}{gravitational constant}
5\STRlabel[G]{G$} \STRcopy{G} is \STRlabel[U]{U$} \STRcopy{U}
  \begin{equation}
7 \STRcopy{U} = -\STRcopy{G}\frac{\STRcopy{m1}\STRcopy{m2}}{\STRcopy{r}}+\STRcopy{K}
  \end{equation}
9where \STRcopy{K} is the \termref{cd=physics-constants, name=integration}{constant
  of integration}. Choosing the convention that \STRcopy{K}$=0$ makes calculations
11simpler, albeit at the cost of making \STRcopy{U} negative.
```

Creating authoring services experience

- editors are nice until you start developing extensions
 - Simple things should be simple, complex things should be possible. [Alan Kay]
 - Simple - the ones developed envisioned \neq semantic services
- maintenance is (a big) issue


DEMO

New model

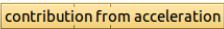


- framework based on Operational Transform (tech. underlying Google Docs)
- separates authoring service runtime from editing environment
e.g. \Rightarrow allows heavy-weight services (NLP) to be integrated real-time into Web
- develop (authoring service) once \rightarrow deploy on Web, Eclipse, jEdit, Sublime - what have you...

(Semantic) Mathematics on the Web

$$s = s_i + v_i \Delta t + \frac{1}{2} a (\Delta t)^2$$
A context menu is displayed over the equation, containing two options: "Fold" and "Semantic Fold". A mouse cursor is pointing at the "Semantic Fold" option.

Fold
Semantic Fold

$$s = s_i + s_v + s_a$$
A yellow rectangular box is positioned below the equation, containing the text "contribution from acceleration".

contribution from acceleration

- Math \rightarrow \LaTeX
- \LaTeX on the Web \Rightarrow $\left[\begin{array}{l} \text{LaTeXML} \\ \text{MathJax} \end{array} \right.$

MathJax vs LaTeXML

MathJax

- Enable Math rendering in MathML unaware browsers (bridge technology)
- Convert (simple) TeX \rightarrow MathML

LaTeXML

- very good coverage of LaTeX
- can convert fragments of LaTeX documents (faster than LaTeX itself)
- supports Semantic LaTeX (sTeX) to produce Semantically annotated MathML

DEMO(s)

Conclusion

- Active semantic documents (JOBAD)
- Authoring semantic documents (RedSyS)
- Semantic mathematics (LaTeXML & MathWebSearch)